



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: Box ISSUE FEE
ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

26M2/1017

MARK J GEBHARDT
SCHWEGMAN LUNDBERG & WOESSNER
3500 IDS CENTER
MINNEAPOLIS MN 55402

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
08/410,179	03/23/95	018	OEHLING, G	2608 10/17/96
First Named Applicant	RUSSELL, DAVID S.			

TITLE OF INVENTION CELLULAR COMMUNICATIONS SYSTEM WITH CENTRALIZED BASE STATIONS AND DISTRIBUTED ANTENNA UNITS

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPL. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
2 SLW-500.002U	379-059.000	FV9	UTILITY	NO	\$1290.00	01/17/97

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.

HOW TO RESPOND TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.
If the SMALL ENTITY is shown as yes, verify your current SMALL ENTITY status:

- A. If the status is changed, pay twice the amount of the FEE DUE shown and notify the Patent and Trademark Office of the change in status, or
- B. If the status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

- A. Pay FEE DUE shown above, or
- B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

II. Part B of this notice should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "6b" of Part B should be completed.

III. All communications regarding this application must give application number and batch number.
Please direct all communication prior to issuance to Box ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
--------------------	-------------	-----------------------	---------------------

08/410,129 03/23/95 RUSSELL

D SLW-500,0020

EXAMINER

26M2/1017

MARK J GEBHARDT
SCHWEGMAN LUNDBERG & WOESSNER
3500 IDS CENTER
MINNEAPOLIS MN 55402

ART UNIT 110 PAPER NUMBER

10

DATE MAILED: 2608

10/17/96

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

NOTICE OF ALLOWABILITY

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course.

☒ This communication is responsive to the amendment filed 7-19-96
☒ The allowed claim(s) is/are 49-64 (renumbered as claims 1-16, respectively)

- ☐ The drawings filed on _____ are acceptable.
- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) _____
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

- ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

A SHORTENED STATUTORY PERIOD FOR RESPONSE to comply with the requirements noted below is set to EXPIRE **THREE MONTHS** FROM THE "DATE MAILED" of this Office action. Failure to timely comply will result in ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

- ☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.

☒ Applicant MUST submit NEW FORMAL DRAWINGS

- ☐ because the originally filed drawings were declared by applicant to be informal.
- ☒ including changes required by the Notice of Draftperson's Patent Drawing Review, PTO-948, attached hereto or to Paper No. 6
- ☐ including changes required by the proposed drawing correction filed on _____, which has been approved by the examiner.
- ☐ including changes required by the attached Examiner's Amendment/Comment.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the reverse side of the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftperson.

- ☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any response to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

Attachment(s)

- ☒ Notice of References Cited, PTO-892
- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s): 9
- ☒ Notice of Draftperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Interview Summary, PTO-413
- ☒ Examiner's Amendment/Comment
- ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
- ☒ Examiner's Statement of Reasons for Allowance

Art Unit: 2608

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

IN THE ABSTRACT:

The original Abstract of Disclosure has been substituted with a new Abstract attached hereto.

IN THE CLAIMS:

Misnumbered claims 45-60 have been renumbered as claims 49-64 in accordance with 37 CFR 1.126.

Reasons for Allowance

2. The following is a statement of reasons for the indication of allowable subject matter:

Although the patent to Lappington teaches the digitization of telephony signals at a base station for transmission over a CATV network to remote antenna sites, this digitization occurs prior to the combining of the plurality of telephony signals into a single composite signal. This is in contrast to the present invention, as defined by claims 49-64, which performs such digitization after the plurality of analog telephony signals have been combined into a single composite signal.

Art Unit: 2608

Thus, the prior art of record fails to teach the combining of analog telephone signals prior to digitization of the signals for transmission over a digital transport link between a base station and remote antenna sites.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

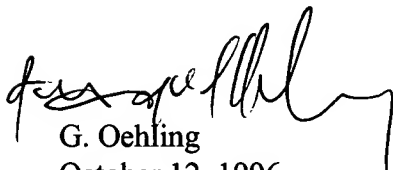
U.S. Patent 4,718,004 issued to Dalal discloses a sample data acquisition system. Of particular note in figure 3, two analog signals are passed through an analog multiplexer (14-4) and then through an A/D converter (14-10) for conversion to a digital signal. However, as described in col. 4, lines 20-32, the analog MUX *selects* one of the two analog signals, as opposed to combining both of the analog signals, and passes the selected analog signal to the A/D converter. This is in contrast to the present invention which combines a plurality of analog signals into a single composite signal representative of the plurality of analog signals.

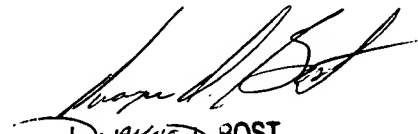
Art Unit: 2608

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **George Oehling** whose telephone number is **(703) 305-4835**. The examiner can normally be reached M-F from 7:00 AM to 3:30 PM.

The fax phone number for this Group is **(703) 305-9508**.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is **(703) 305-4700**.


G. Oehling
October 12, 1996


DWAYNE D. BOST
PRIMARY EXAMINER
GROUP 2600

Art Unit: 2608

ABSTRACT OF THE DISCLOSURE

A method of communicating a plurality of two-way inbound/outbound cellular telephone transmissions between a base station and a physically remote cell using a set of channels. At the base station, a plurality of outbound telephone transmissions, received from a network, are analog modulated onto respective ones of RF analog outbound channel carriers. The modulated analog channel carriers are combined to form a single RF analog outbound signal representing all of the outbound telephone transmissions in the set of channels. The analog outbound combined signal is subsequently digitized into a single stream of outbound digital samples and transmitted to the remote cell. At the remote cell, the stream of digital samples is converted back to the RF analog outbound combined signal and broadcasted directly to mobile units in the cell. Further, the remote cell receives a plurality of simultaneous inbound telephone transmissions from the mobile units as an RF analog inbound combined signal. The analog inbound combined signal is digitized into a single stream of inbound digital samples and transmitted to the base station. At the base station, the stream of inbound digital samples is converted into a single RF analog inbound signal, the inbound telephone transmissions are recovered from the single RF analog inbound signal, and delivered to the network.

08/410129

Serial Number: 08/410,129

Page 5

Art Unit: 2608

ABSTRACT OF THE DISCLOSURE

A method of communicating a plurality of two-way inbound/outbound cellular telephone transmissions between a base station and a physically remote cell using a set of channels. At the base station, a plurality of outbound telephone transmissions, received from a network, are analog modulated onto respective ones of RF analog outbound channel carriers. The modulated analog channel carriers are combined to form a single RF analog outbound signal representing all of the outbound telephone transmissions in the set of channels. The analog outbound combined signal is subsequently digitized into a single stream of outbound digital samples and transmitted to the remote cell. At the remote cell, the stream of digital samples is converted back to the RF analog outbound combined signal and broadcasted directly to mobile units in the cell. Further, the remote cell receives a plurality of simultaneous inbound telephone transmissions from the mobile units as an RF analog inbound combined signal. The analog inbound combined signal is digitized into a single stream of inbound digital samples and transmitted to the base station. At the base station, the stream of inbound digital samples is converted into a single RF analog inbound signal, the inbound telephone transmissions are recovered from the single RF analog inbound signal, and delivered to the network.